fnmoc_MDCHNL_1101_sof

Defense Information Infrastructure (DII)

Common Operating Environment (COE)

Statement of Functionality (SOF)
for the
METOC Channels (MDCHNL) Segment
Release 1.1.0.1

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1 SCOPE

1.1 Identification

This document describes the functionality of the METOC Channels (MDCHNL) Segment of the METCAST data distribution software, Release 1.1.0.1, developed by Fleet Numerical Meteorology and Oceanography Center (FNMOC), Monterey, CA.

1.2 System Overview

METCAST is a standards-based, request-reply and subscription (channel) system for distributing weather information over the Internet using Hyper-Text Transfer Protocol (HTTP) and Multipurpose Internet Mail Extensions (MIME). The METCAST Server Segment is responsible for processing requests for data from METCAST Clients, interfacing with a database to attempt to satisfy each request, and formatting the retrieved data as specified in the request before returning the data to the client. The METCAST Client comprises a separate segment. The MDCHNL segment provides the Channels database for METCAST Server.

1.3 Document Overview

Section 2 of this document describes the METCAST system in greater detail to afford some insights into the role filled by the MDCHNL segment. Section 3 describes the functionality of the MDCHNL segment.

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2 METCAST FUNCTIONALITY OVERVIEW

METCAST is a standards-based, request-reply and subscription system used to transmit data across the web using HTTP. METCAST uses a client-server architecture in which a server, connected to a METOC database, publishes a dynamic product list showing all data currently in the system and all channels available through the server. Clients subscribe to the product list automatically when their connection to a server is active, and thus continually maintain a list of data available on the system. A client may be connected to multiple servers, and will maintain a separate product list for each server.

The METCAST Client provides a graphical user interface (GUI) that allows users to:

- Define geographical areas of interest in Mercator or polar stereographic projections, or select from available satellite areas or special areas.
- Define a product suite for each area of interest defined. Products are selected from a Dynamic Product List that is constantly updated by each server, so that the user only sees those products that are actually available for download at the time of selection.
- For each server, specify the scheduling options for each type of data (grids, observations, imagery, and channels) requested. Products may be retrieved on demand, at scheduled times, or at specified intervals. The user may also specify the number of images to be held on the system and the maximum age of the products to be retrieved.
- Schedule areas of interest. The system will not retrieve any data for an area until it is scheduled (activated). Once scheduled, the area may be unscheduled at any time to deactivate retrievals.
- Monitor and interact with retrievals in progress. A Java-based Retriever Monitor shows the status of active and completed retrieval sessions, and allows the user to start a stopped or sleeping session, stop an active or sleeping session, or remove a session entirely. An Area Status function is also available to show in real time the products retrieved for an area.
- To view, in conjunction with Joint METOC Viewer (JMV), all downloaded data on a map background or, for upper air data, a Skew-T, Log P diagram.

When a request is scheduled, the METCAST Client formulates a request message and forwards it via Hyper-Text Transfer Protocol (HTTP) to the server(s) from which the data are requested. The server checks its database to find out whether it has any new data to fill the request. If not, it

returns a message to that effect. If there is new data, the server extracts the data from its database, packages it, and returns it to the client.

METCAST Channels allow users to publish and subscribe to information of any origin and format. Channels may be used to distribute updates to METCAST itself and JMV, to send presentations or documents between users, and to automatically retrieve certain information (the dynamic product list, for example, is retrieved via a channel, as are tropical cyclone warnings and significant meteorological bulletins (SIGMETS)). Individual channels can be assigned permissions, allowing only specified users to access them. This provides an efficient means for distributing information to limited groups of users. An on-scene commander, for example, could establish a channel limited to participants in a particular operation that can be used to exchange information pertaining to that operation. A GUI is provided in the METCAST Client to allow users to subscribe to channels, specify the frequency of retrievals of channel information, and schedule channels. The GUI also permits a user to publish any file to any channel to which he/she has access.

The MDCHNL segment provides functionality at the server end to set up and administer channels, and to maintain a database of channel content for each channel maintained by the server.

3 MDCHNL SEGMENT FUNCTIONALITY

3.1 Administering METCAST Channels

METCAST Server, through the MDCHNL segment, provides a web browser-based interface for administering channels. This interface allows an approved user to create new channels, assigning MIME types and user permissions to them, to modify existing channels, and to delete channels. Each of these functions is described below. To start the Channel Administration interface, the user starts the browser and navigates to the site on his web server at which the Channel Administration main page is installed.

3.1.1 Creating a New Channel

The Channel Administration page provides two interfaces for creating a new channel – the Channel Wizard, which walks the user step by step through the process, and a manual method where you simply enter all of the channel parameters on a form.

3.1.1.1 The Channel Wizard

The Channel Wizard provides step-by-step instructions for setting up a new channel. When the Channel Wizard button is clicked, the first channel definition screen is displayed:

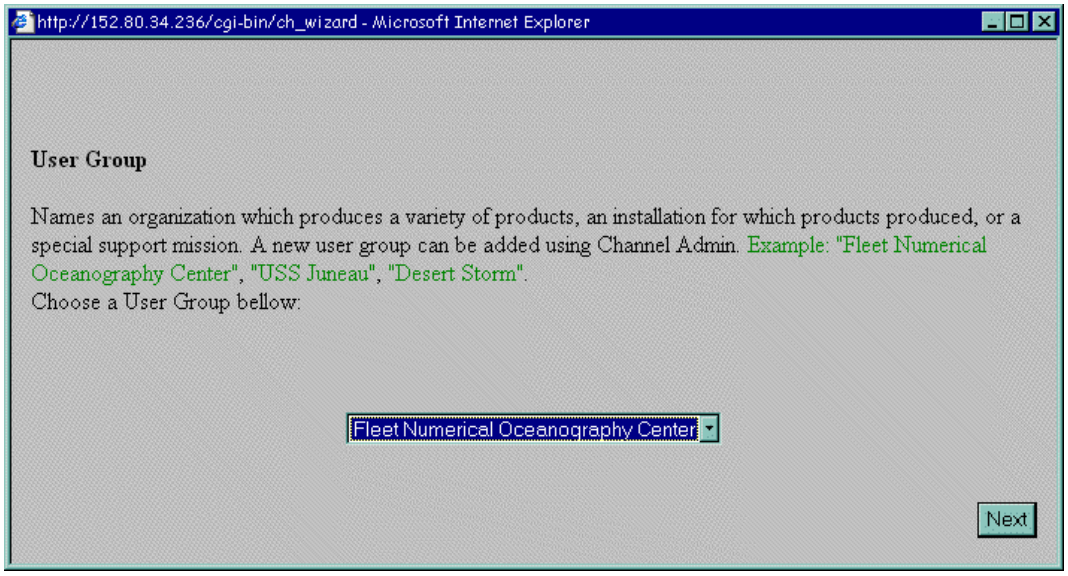

Figure 1. Channel Wizard Opening Screen

This screen is used to select a User Group. To open the list of user groups that are available, click on the down-pointing arrowhead next to the list box. Clicking any item in the list selects it,

closes the list box, and displays the new selection in the box. Clicking the **Next** button continues in the Wizard. To add a new user group, the user must go back to the main Channel Admin page (use the browser's **Back** button) and use the **Add** button under the **User Group** heading (see Section 5.1.2 for details).

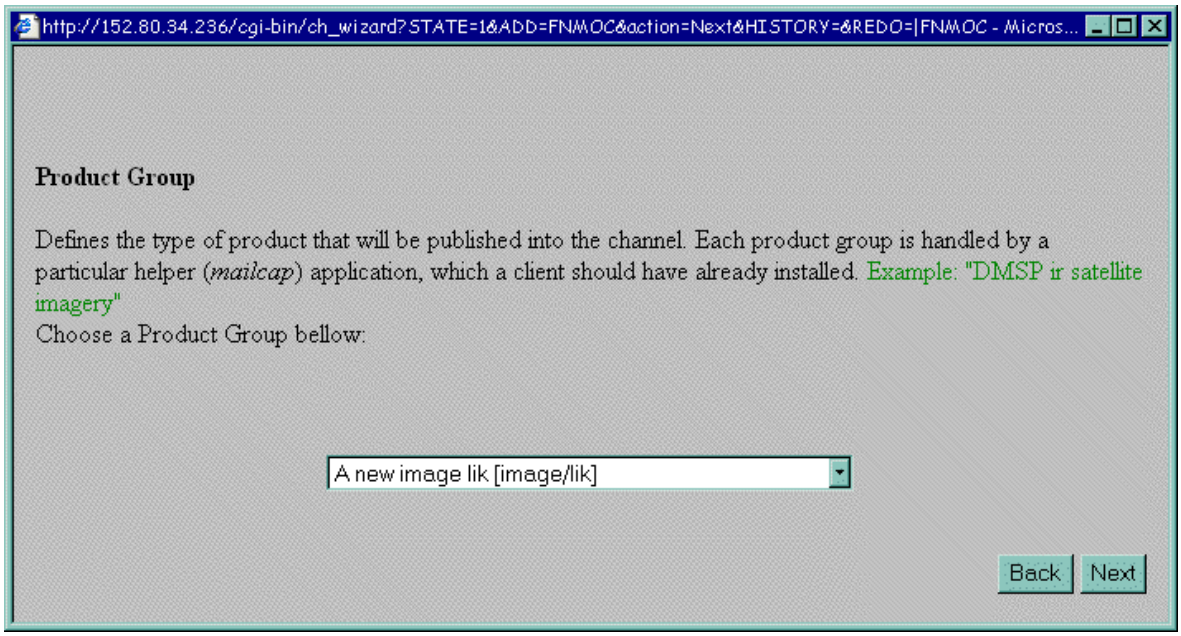

Figure 2. Channel Wizard Screen 2

The second screen of the Wizard, shown in Figure 2, is used to select a Product Group. The user pulls down the Product Group list and selects any item. Clicking the **Next** button proceeds to Screen 3, while the **Back** button returns to the opening screen. To add a new product group, the user must go back to the main Channel Admin page (using the browser's **Back** button) and use the **Add** button under the **Product Group** heading (see Section 5.1.4 for details).

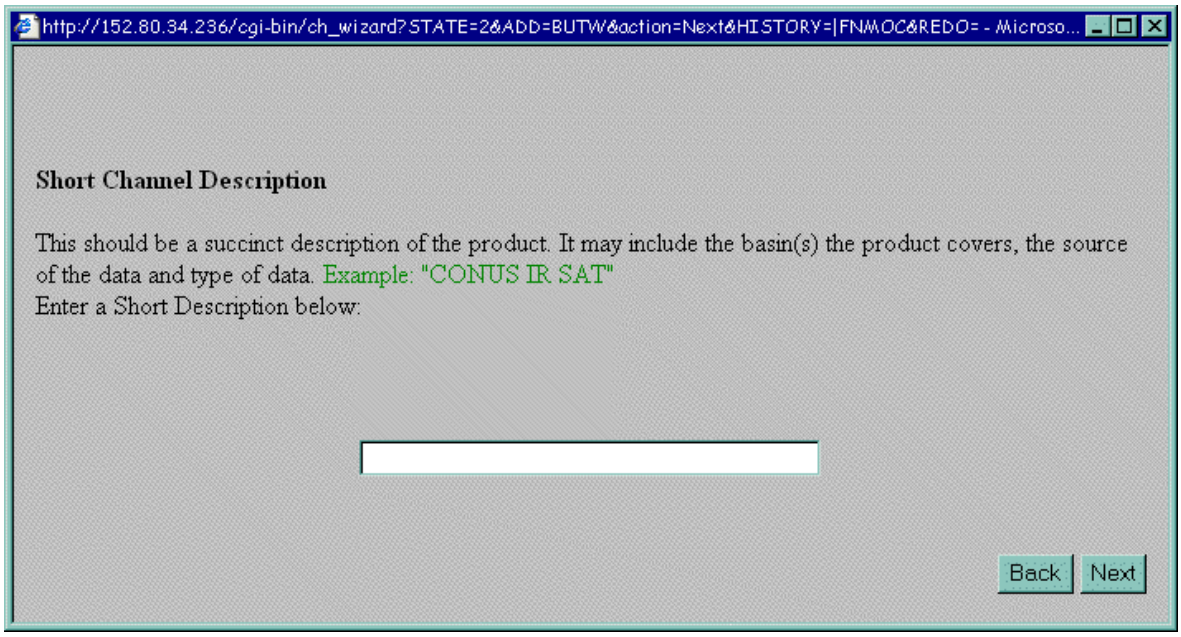

Figure 3. Channel Wizard Screen 3

The third screen of the Wizard is used to enter a short description of the channel. The user types the description into the text entry box. Clicking on the **Next** button proceeds to the next screen, shown in Figure 4, while the **Back** button returns to Screen 2.

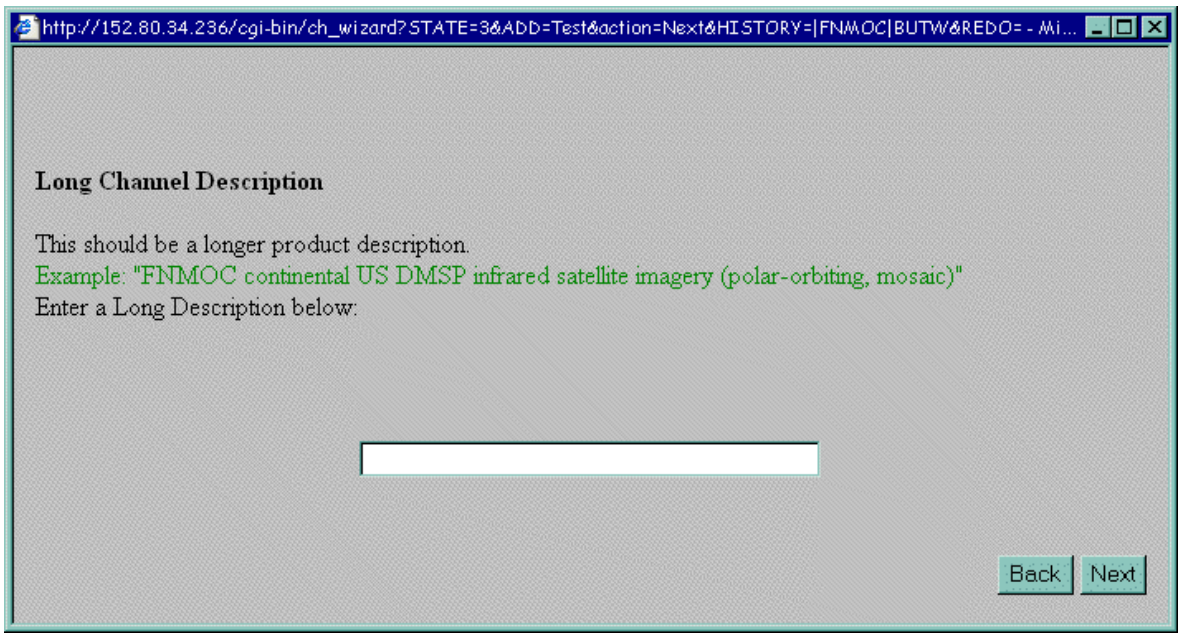

Figure 4. Channel Wizard Screen 4

This screen is used to enter the full channel description. The user types the description into the text entry box. Clicking on the **Next** button proceeds to the next screen, shown in Figure 5, while the **Back** button returns to Screen 3.

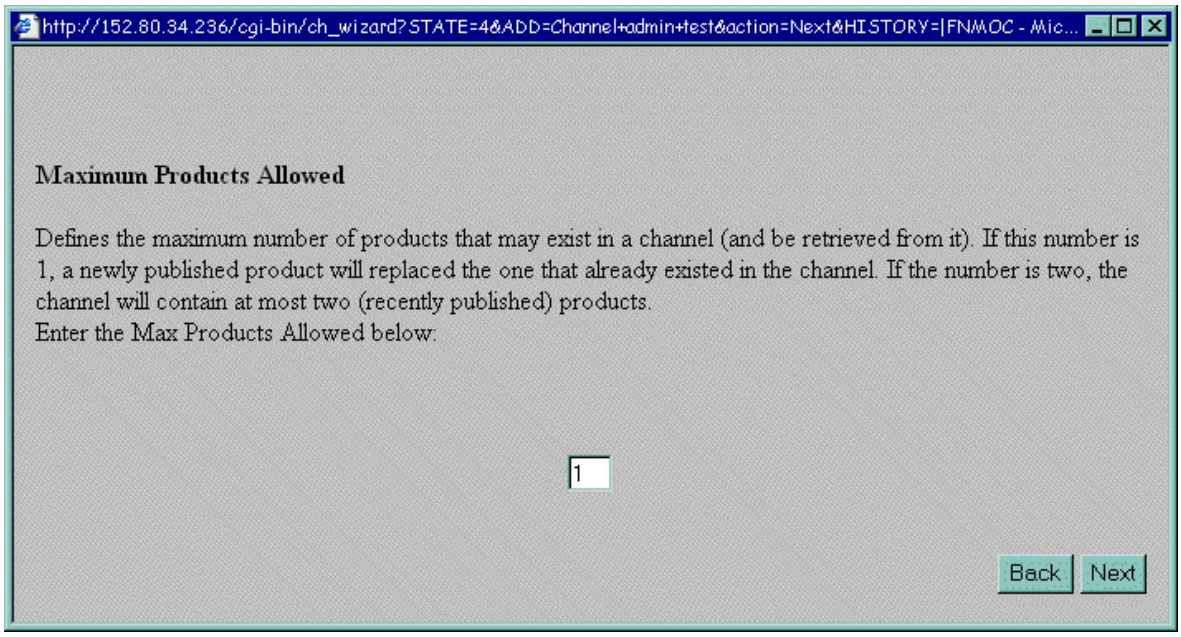

Figure 5. Channel Wizard Screen 5

This screen allows the user to specify the maximum number of products that may exist in the channel. Setting this number to a low value reduces the amount of disk space used to store the channel data; higher values require more disk space. The user enters the desired number in the entry box. Clicking on the **Next** button proceeds to the next screen, shown in Figure 6, while the **Back** button returns to Screen 4.

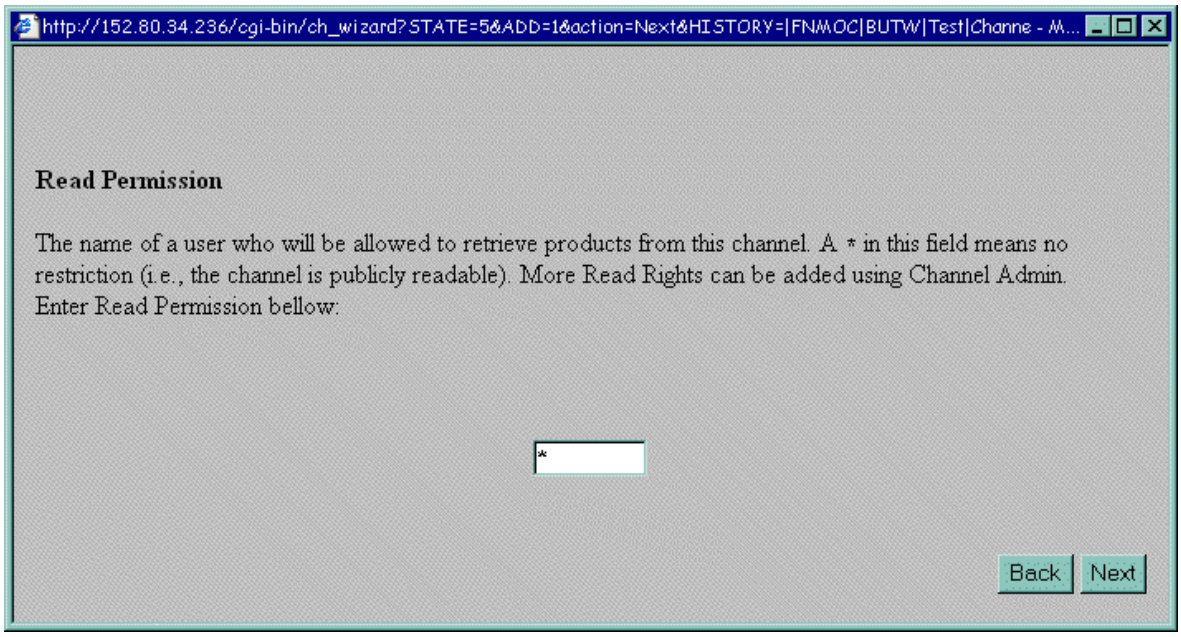

Figure 6. Channel Wizard Screen 6

This screen is used to establish read permissions for the channel. The name of a user, or *, is typed in the entry box as directed. This is used to establish rights for only one user; to add more users, the user must use the **Modify or Delete** option under the Channels heading on the main Channel Admin page. Clicking on the **Next** button proceeds to the final screen, shown in Figure 7, while the **Back** button returns to Screen 5.

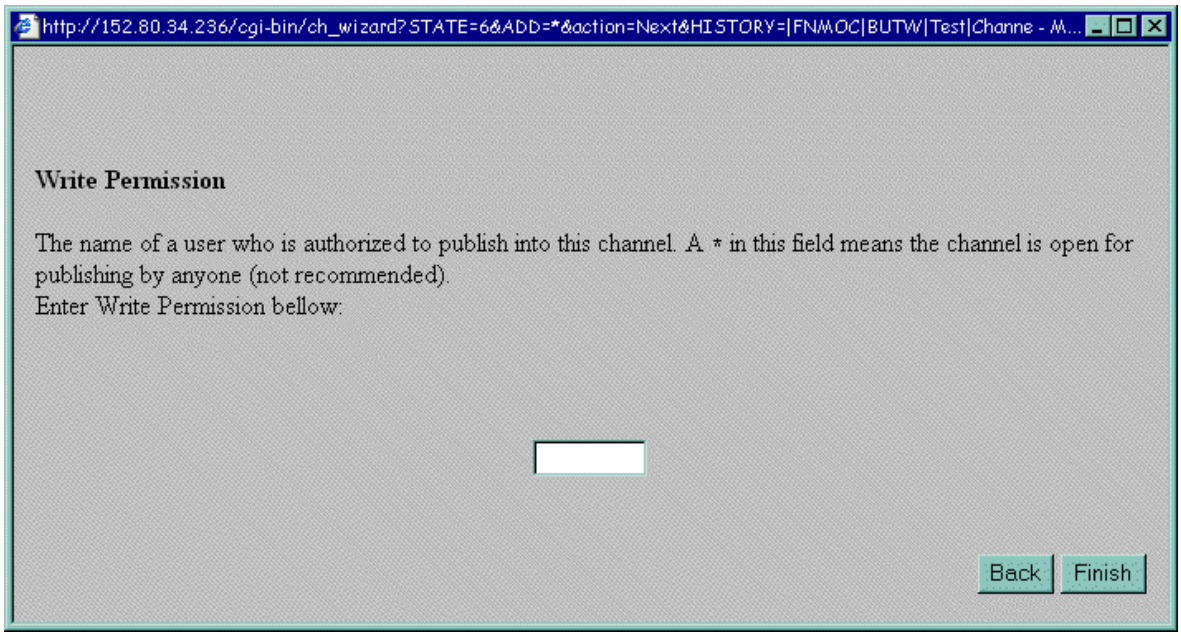

Figure 7. Channel Wizard Screen 7

The final screen of the Wizard is used to establish one user with write permission for the channel. To add write permission for more users, the **Modify or Delete** option under the Channels heading on the main Channel Admin page should be used. Clicking on the **Finish** button completes the channel creation process, while the **Back** button returns to Screen 5.

3.1.1.2 Creating a Channel Manually

The **Add** button under the Channels heading on the main Channel Admin page opens the page shown in Figure 7, which allows the user to make all entries for a new channel on one page. It is the functional equivalent of the Channel Wizard for more advanced users.

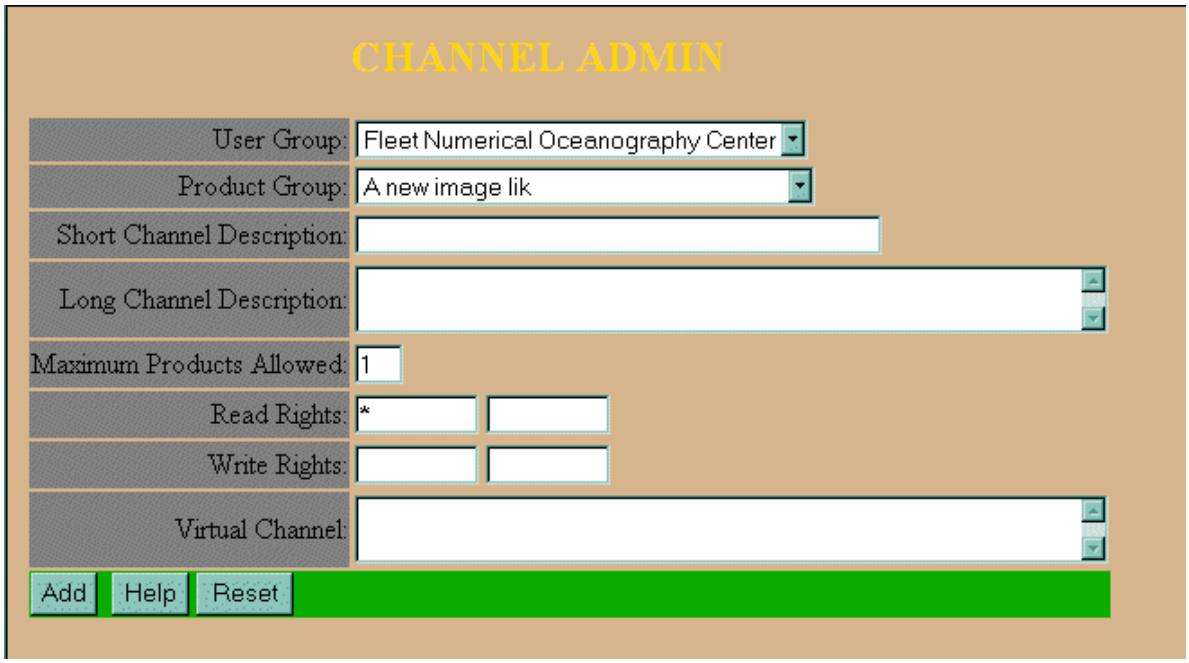

Figure 8. Add Channel Screen

- **User Group** defines the group of users who will be participating in the channel (publishing/reading). Selection is made from a pull-down list. To add a new user group, the user must go back to the main Channel Admin page (use the browser's **Back** button) and use the **Add** button under the **User Group** heading (see Section 5.1.2 for details).

- **Product Group** defines the type of products that the channel will handle. Each product type has an entry in the *mailcap* file that tells the METCAST Client at the receiving end how to handle data downloaded via the channel. Selection is made from a pull-down list. To add a new product group, the user must go back to the main Channel Admin page (use the browser's **Back** button) and use the **Add** button under the **Product Group** heading (see Section 5.1.4 for details).

- **Short Channel Description** is used to enter a succinct description for the channel. Entry is made by typing into the text box.

- **Long Channel Description** is used to enter a more complete channel description. Entry is made by typing into the text box.

- **Maximum Products Allowed** defines the maximum number of products that will be allowed into the channel at one time. If 1 is entered, the product will be overwritten whenever a newer product is published into the channel. If 2 were entered, the last two products published into the channel would be kept, and so on.

- **Read Rights** should be a * if everyone will have the right to retrieve products from the channel. It can also be a METCAST user name.

- **Write Rights** should be a METCAST user name or the METCAST user name of the Publishing Facility. Could be a * but not recommended, as this would allow everyone to publish into the channel.

- **Virtual Channel** -- A virtual channel is the one that stores its content in a place other than the usual MDCHNL database, or one that requires a special processing of incoming content. For example, one may set a virtual channel for tropical cyclone warnings, MORIAH reports, or satellite imagery. These products are not normally stored in the MDCHNL database.

The **Add** button adds the channel defined by the entries on the screen to the Channels list. The **Help** button opens a help screen in a separate window. The **Reset** button resets all entries to the default values.

3.1.2 Creating a New User Group

A User Group is an organization that produces a variety of products, an installation for which products are produced, or a special support mission. Examples are “Fleet Numerical Oceanography Center”, “USS Juneau”, and “Desert Storm”. A new user group can be added in Channel Admin by clicking on the **Add** button under the User Group heading. This opens the Add User Group screen shown in Figure 9.

- **User Group ID** is the key to this User Group's database entry. Once set, this value can only be changed if this User Group is deleted and re-created. Most often the acronym of the publishing facility is used. Example: "FNMOC"

- **Description** can be changed and is only used to better identify the User Group. Most often the full name of the publishing facility is used. Example: "Fleet Numerical Meteorology Oceanography Center"

- **Contact Info** can be changed and is the address used to contact the User Group regarding their products. Most often the e-mail of a position within the Publishing facility is used. Example: "webmaster@fnmoc.navy.mil"

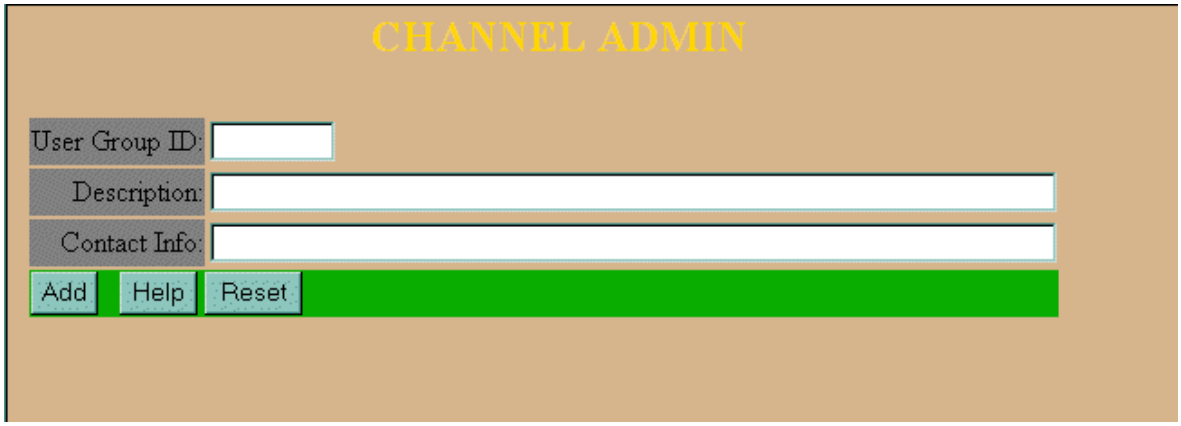

Figure 9. Add User Group Screen

All entries are made by typing in the entry boxes. The **Add** button adds the user group defined by the entries to the User Group list. The **Help** button opens a help window. The **Reset** button clears all entries.

3.1.3 Deleting or Modifying a User Group

The User Group currently selected in the User Group list box may be modified or deleted by clicking the **Modify or Delete** button under the User Group heading. This opens the dialog shown in Figure 10.

As mentioned in Section 5.1.2, the User Group ID cannot be changed. If you want to change a User Group ID, you must delete the User Group and create one with the desired new ID. The Description and Contact Info may be changed by simply typing new values into the boxes. The **Change** button changes the Description and/or Contact Info to the values currently shown in the entry boxes. The **Delete** button deletes the user group currently displayed. The **Reset** button resets all entries to their original values.

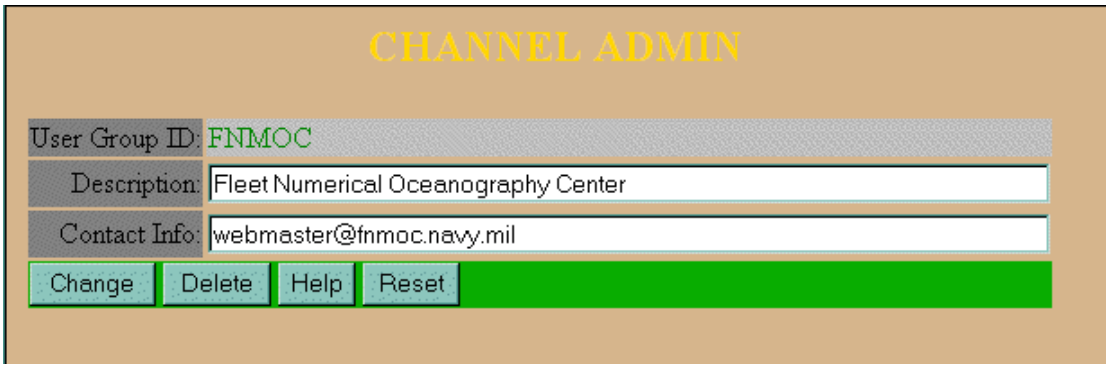

Figure 10, User Group Modify/Delete Screen

3.1.4 Creating a New Product Group

A Product Group is a collection of product types that need to be handled similarly by a METCAST Client. For example, you might create a PowerPoint product group that represented all PowerPoint slide shows. These would be assigned a common MIME type, and then users could configure their mailcap files to ensure that PowerPoint slide shows always were routed to PowerPoint for display. A Product Group is just a way to tell users at the Client end what types of data are in the channel and to give them enough information to decide how to handle the data when it arrives at the Client.

A new Product Group can be created by clicking the **Add** button under the Product Group heading in Channel Admin. This opens the screen shown in Figure 11, which allows the user to define the parameters for the Product Group.

- **Product Group ID:** Once set, this value cannot be modified, except by deleting and re-creating the Product Group. This is the key to this Product Group's database entry. Most often the acronym of the product name is used. Example: "DMSP-IR"

- **MIME Type:** Once set, this value cannot be modified, except by deleting and re-creating the Product Group. MIME stands for Multipurpose Internet Mail Extension, a standard system for identifying the type of data contained in a file based on its extension. MIME is an Internet protocol that allows the transfer of binary files across the Internet. This includes graphics, photos, sound and video files, and formatted text documents. MIME has to negotiate many different operating systems and types of software. The MIME type is identifies the product to the Client, which can then consult its mailcap file to find out how to handle the product. Example: "image/gif"

- **Description**: This entry can be changed and is only used to better identify the Product. Most often the full name of the product is used. Example: "DMSP IR satellite imagery"

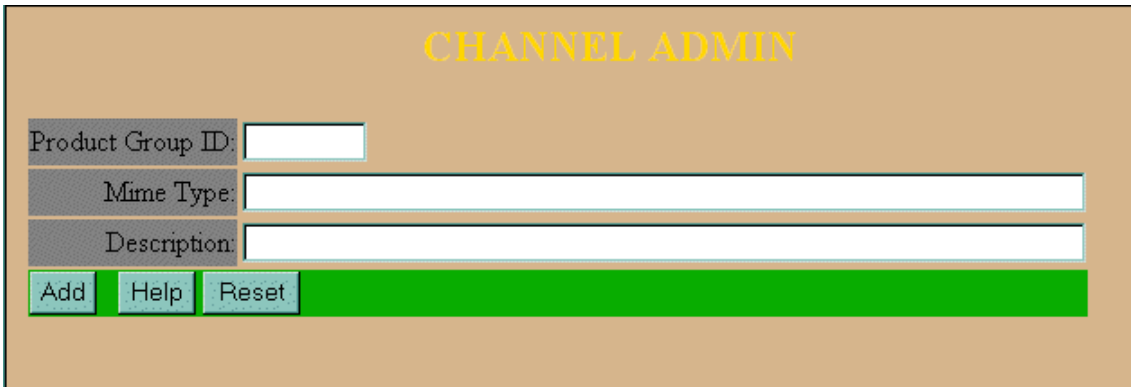

Figure 11. Product Group Add Screen

The **Add** button adds the Product Group defined by the entries to the Product Group list. The **Help** button opens a separate window displaying help on creating a new Product Group. The **Reset** button clears all entries.

3.1.5 Modifying or Deleting a Product Group

The Product Group currently selected in the Product Group list box can be modified or deleted by clicking on the **Modify or Delete** button under the Product Group heading. This opens the Product Group Modify/Delete screen shown in Figure 12.

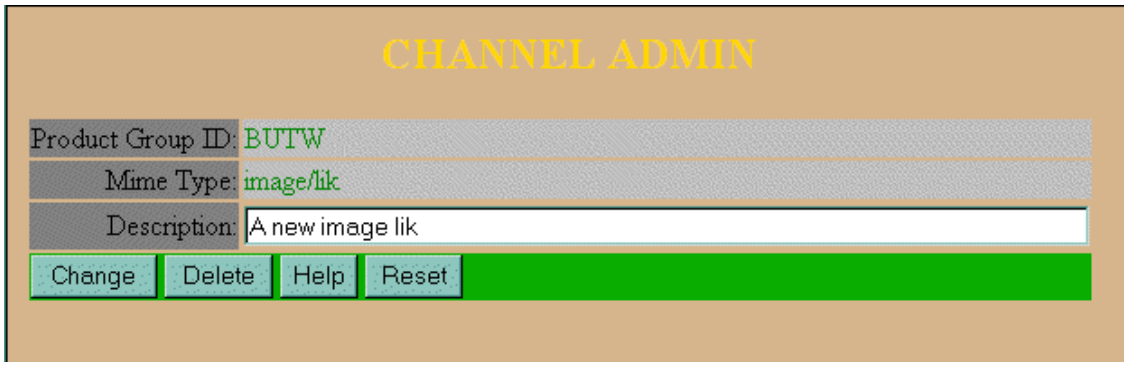

Figure 12. Product Group Modify/Delete Screen

As stated in Section 5.1.4, the Product Group ID and Mime Type cannot be changed unless the Product Group is deleted and re-created. The Description may be changed by typing a new description into the entry box. The **Change** button changes the Product Group information to the new values. The **Delete** button deletes the Product Group currently displayed. The **Help** button displays help in a separate window. The **Reset** button resets all entries to their original values.

3.1.6 Modifying or Deleting a Channel

To modify channel information, or to delete a channel, start by clicking the **Modify or Delete** button under the Channels heading. This opens the Channel Search dialog shown in Figure 13. This dialog is used to find the channel(s) to be modified or deleted.

A search may be done by User Group (gets all channels for the selected User Group), Product Group (gets all channels for the selected product type), Channel ID (gets the channel with the selected channel ID), or keyword (gets all channels whose descriptions contain the keyword(s) entered). The first three criteria are selected from pull-down lists; the keyword(s) may be entered in a type-in entry box. The **Select** button searches for and selects all channels matching your search criteria. The **Add** button opens the Channel Add dialog (see Section 5.1.1.2). The **Help** button opens a separate Help window. The **Reset** button resets all of the search criteria to their default values.

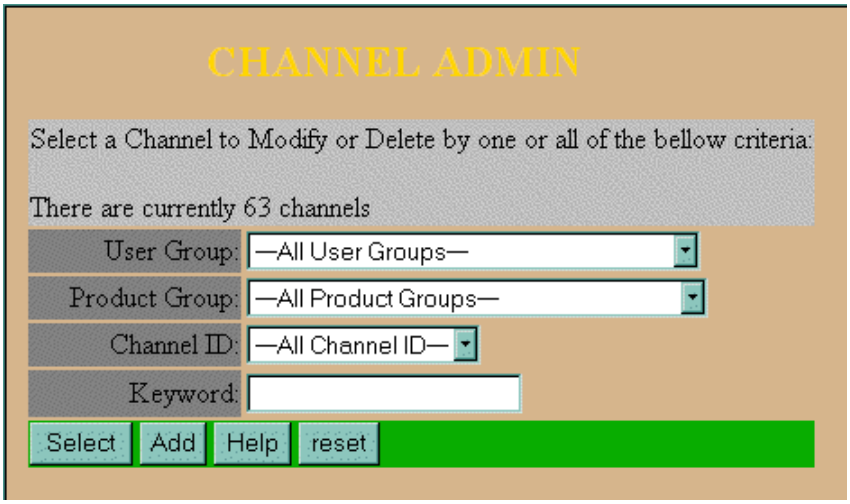

Figure 13. Channel Search Dialog

Clicking the **Select** button after setting the search criteria causes Channel Admin to search for and select all channels matching the specified criteria. Figure 14 shows the results of such a search.

This dialog displays all of the channels found that met the search criteria. For each channel, there are three option buttons:

- **Edit** opens the Channel Edit dialog (Figure 15), which allows editing of certain channel properties (those displayed in gray boxes may not be edited).

- **Add Rights** opens the Add Rights dialog (Figure 16), which allows addition or deletion of users' Read and Write privileges for the channel.

- **Delete** deletes the selected channel.

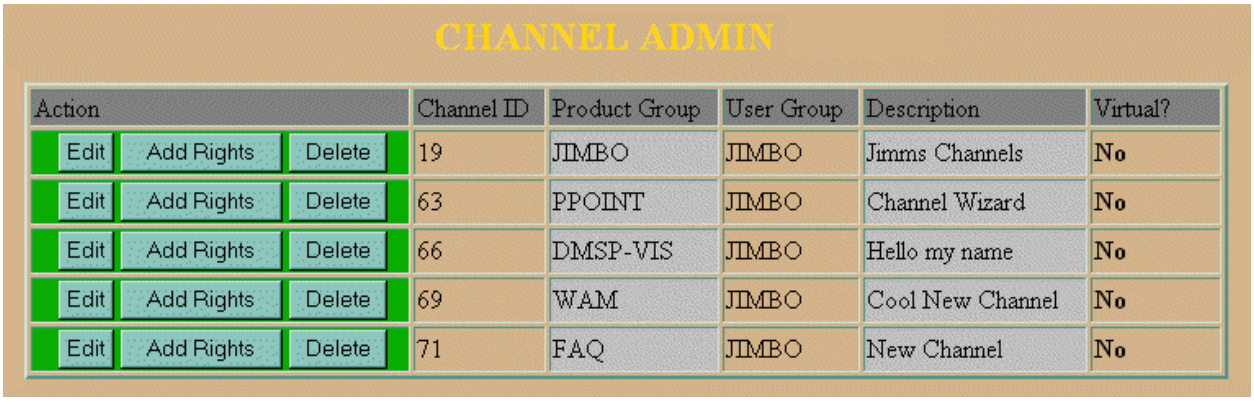

Figure 14. Channel Search Results Dialog

Figure 15. Channel Edit Dialog

In this dialog, the values in the white boxes may be edited (values in the gray boxes cannot be changed). The **Change** button changes the channel properties to reflect what is shown in the boxes. The **Help** button opens a separate Help window providing assistance in editing channel properties. The **Reset** button resets the entries to their original (unedited) values.

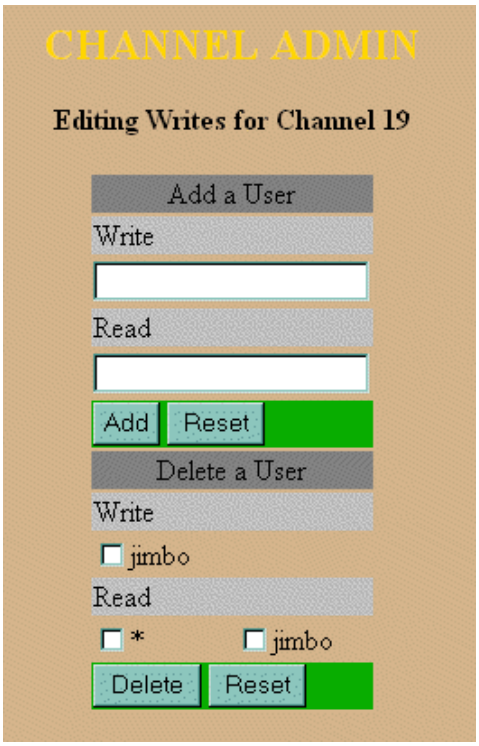

Figure 16. Add Rights Dialog

This dialog is used to add or delete user rights. You can grant a user rights by typing the user name in the Write and/or Read boxes and then clicking on the **Add** button. Granting a user Read privileges means that the user can read information that is in the channel. Granting Write privileges means that the specified user can publish information to the channel for others to view. The **Reset** button clears the entry boxes.

The Delete a User section displays the users granted rights to the channel. To delete a user, click on the check box next to the user name – an X will appear in the box when it is selected. Then click on the **Delete** button to delete the selected rights for that user. Separate check boxes are provided for Write and Read privileges. The **Reset** button clears all of the check boxes.

3.2 The Channels Database

The other function of the MDCHNL segment (besides Channel Administration) is to establish and maintain a database of channel information. The database is hosted in a Commercial Off-the-Shelf (COTS) Relational Database Management System (RDBMS). Currently Informix is the RDBMS that serves as the foundation for the Channels database. In addition to establishing the database, the MDCHNL segment provides functions to ingest new channel data into the database and to retrieve requested channel data from the database and package it for transmission

to a METCAST Client. All of this functionality is basically transparent to the user, and should require little if any attention from the Database Administrator or System Administrator.